REMARKS

I. Claims

The abstract of the disclosure is amended. No new matter is added.

Amendments to the Drawings are made. No new matter is added.

Claims 1-11 are amended. No new matter is added.

II. Objection to the Specification

The Examiner objects to the abstract of the disclosure because the designations numeral [11} for control unit do not match with the drawings. The reference numerals in the abstract are cancelled. No new matter is added.

The Examiner objects to the drawings under 37 CFR 1.83(a) because they fail to show reference numeral for a starting circuit and incorrect numeral for control unit as described in the specification. A replacement sheet of Figs 1 and 2 including the changes requested by the Examiner for filing in the application is at the back of this paper. No new matter is added.

III. Claim rejections 35 U.S.C. §102

The rejection of claims 1, 5-8, 10 and 11 under 35 USC §102(b) as being anticipated by Bogwicz et al. (U.S. 5,892,349) is traversed.

Applicants invention is directed toward minimizing the time that the starting coil in a single speed, single phase induction motor is energized. When current is first applied to an induction motor, current begins to flow through the main coil and the starting coil. At this instant, the current

through the two coils is relatively large because the rotor is not rotating and there is no counter electromotive force. Thus, at start up the current through the motor substantially equal to a locked rotor condition. As the rotor begins to rotate, which is caused by the interaction of the magnetic fields created by the current passing through both the running and the starting coils, the currents through the two coils are gradually reduced. This process continues until the motor reaches the rotation speed close to its synchronous speed, at which time the current detecting mechanism switches off the current to the starting coil. From this moment on, there is only current in the running coil.

At start up, the current through the motor is sensitive to the torque level on the rotor. A high torque will extend the starting period and result in the starting coil being energized for a longer time. A low torque condition will allow the rotor to accelerate faster and come up to speed in a shorter interval of time. Other factors which can determine how long the staring coil is energized is the supply voltage (under voltage, nominal voltage or over voltage) and the temperature of the motor windings.

Applicants disclose a circuit which turns off the flow of current to the starting coil in the shortest time to conserve energy. See the PreGrant Publication, paragraphs [0036]-[0040]. In Applicants invention, after determining the starting current level Ip which occurs when the motor is first turned on, the current level is continuously measured as Ia and the ratio between these values is constantly calculated as K. At each new detection time of the current level Ia, a new value for K is calculated. As the motor accelerates, the calculated K values diminish at the same rate as the current in the stator diminishes. When the ratio K reaches a value equal to or less than a predetermined

value Km, the current to the starting coil is cut off. The mathematical relationship for determining Km is given in paragraph [0040].

Bogwicz is directed to a two speed motor where the motor start winding is selectively started and stopped at two different low speeds depending on whether the motor is running on its high speed winding or on its low speed winding. Clearly, Bogwicz is not concerned with nor does he disclose structure for reducing the time that current is fed through the starting coil of an induction motor to reduce the amount of current that is used at start-up. Nowhere does Bogwicz disclose or suggest doing what Applicants have disclosed as their invention, that of determining the starting current at start up, continuously measuring the current during start-up, and using these two values to calculate a ratio, and comparing this calculated ratio with a predetermined value Km to determine when the current to the starting coil is turned off.

Claim 1 clearly avoids Bogwicz by reciting, in combination,

> "...control unit is operatively connected to the running switch and to the starting switch, in order to instruct the open and closed conditions thereof, the open condition of the starting switch being defined when the ratio (K) between the present current level (Ia) supplied to the stator and informed by the current sensor to the control unit and the starting current level (Ip) previously informed to said control unit by the current sensor upon the closing of the starting and the running switches, so that when said ratio K reaches a value that is equal or inferior to a predetermined value (Km) the control switch

instructs the opening of the starting switch" (underscoring added for emphasis).

Clearly, Bogwicz neither discloses no suggests measuring voltages and obtaining ratios as is recited in claim 1. Therefore, it is believed that claim 1 avoids Bogwicz and is considered to be in condition for allowance. Claims 5-7 depend from claim 1 and, therefore, are also considered to be in condition for allowance. Claim 8 recites, in steps, the method of obtaining the various voltages and ratios therefrom as explained above and, therefore, for the reasons noted above, also avoids the Bogwicz reference and is considered to be in condition for allowance. Claims 10 and 11 depend from claim 8 and, therefore, are also considered to be in condition for allowance.

IV. Claim rejections 35 U.S.C. §103

The rejection of claims 2 and 9 under 35 U.S.C. §103(a) as being unpatentable over Bogwicz as applied to claim 1 above, and further in view of Aubrey (GB 2089658) is traversed. The Examiner refers to Aubrey, column 1, lines 51-59 as teaching a voltage ratio multiplied to a reference value. But, immediately thereafter , see lines 59-62, Aubrey states that "It will be seen that such a circuit provides the required starting torque but draws the large surge current referred to previously". Thus Aubrey does not disclose the obtaining of voltage ratios as Applicants disclose and claim. For the reasons noted above, claims 2 and 9 clearly avoid the references cited and, therefore, are considered to be in condition for allowance.

V. Claim rejections 35 U.S.C. §103

The rejection of claims 3 and 4 under 35 U.S.C. §103(a) as being unpatentable over Bogwicz is traversed. For the reasons noted above, claims 3 and 4 clearly avoid Bogwicz and are considered to be in condition for allowance.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

The Examiner is respectfully requested to contact the undersigned at the telephone number indicated below if the Examiner believes any issue can be resolved through either a Supplemental Response or an Examiner's Amendment. In view of the above amendment, applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

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